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A Shift in Our Thinking: Reframing Shared Research Resources as Investments in Education and Innovation, Not Subsidized Science

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ABSTRACT

For many researchers, Shared Research Resources are often the most cost-effective means of using state-of-the-art (not to mention expensive) instrumentation. Along with access to the instruments themselves, Shared Research Resources also offer individualized training by highly qualified Shared Research Resource staff—again at deeply discounted costs compared to the operational costs of the facilities. Traditionally, this gap in revenue has been termed a subsidy. But, as with many words, connotation matters, and we posit that this language ought to be changed to reframe our thinking and impart the true impact of Shared Research Resources. We argue here that rather than a subsidy, the revenue gap is better described as an investment. Furthermore, investments of Shared Research Resources lead to positive externalities, including education and innovation.

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INTRODUCTION

In preparing this communication, we were guided by the famous words attributed to Albert Einstein who said, "We cannot solve our problems with the same thinking we used when we created them." The current dynamics, challenges, opportunities, and possibilities surrounding Shared Research Resources (SRRs) are a direct result of our current collective thinking. In recent years, the establishment of SRRs has evolved from organic inception to become more deliberate and strategic in nature. SRRs are more frequently recognized as key infrastructure in the research landscape, and the thinking around the concept of SRRs should also evolve. Therefore, to effectively elevate SRRs to meet the pace of modern scientific inquiry, we must reimagine SRRs with new thinking. Reframing the value of SRRs to institutions allows us to change how we think about the SRR career track and how it relates to other academic professions. Furthermore, to remain competitive, the research community has to change how we think about funding and sustaining SRRs and, perhaps more importantly, how to recognize and promote the professions within SRRs.

A popular discussion among SRR administrators is the fact that their SRRs are often operating at a revenue gap. But it is fundamentally flawed to judge these types of facilities solely on the negative flow of cash. SRRs exist in a nonprofit environment and are governed by funding agencies. Their primary mission is not in turning a profit but rather in maximizing stakeholder investments. At academic institutions, these can be measured as educators and research incubators. Therefore, we are behooved to reframe the value measurement from money focused to mission focused.

Most SRRs were started organically. PIs with shareable equipment established technical and scientific support for the shared equipment. As more users derived value from sharing, departments soon provided dedicated space for the shared equipment. As trained postdoctoral personnel and graduate students moved on from individual research laboratories, administrators began realizing the value of their institutional knowledge, leading to efforts to hire and maintain dedicated SRR staff. Rates were established to defray operational costs, but in order to offer SRR services most equitably, these rates have remained much too low for an SRR budget to end in the black. And here is where our story begins; away from the SRR, it is often difficult to justify the large operational costs of an SRR balanced against the modest recuperation collected in recharge fees. Where else in business does the consumer pay significantly less than the production cost of goods and services, and moreover, in such cases, how can the dynamic survive or even thrive?

Over the lifetime of the current iteration of FASEB's SRR Task Force, we have attempted to do just that—reframe our current thinking about SRRs with a number of discussions centered on the critical need to effectively communicate the *value* of SRRs—beyond the recharge rate. Be it to stakeholders in the president's office or the graduate students down the hall, SRR staff must tailor their sales pitches in a way that the recipient can truly appreciate the keystone position core facilities maintain in the scientific ecosystem.

REVENUE GAPS: A ROSE BY ANY OTHER NAME WOULD SMELL AS SWEET, BUT DOES A SUBSIDY SOUND LIKE A SOLID INVESTMENT?

Among the many merits of SRRs is the fact that they often offer technical services to researchers at costs deeply discounted when compared with the operating costs of these facilities. In a 2019 survey of administrators about 7 common SRRs at their institutions, respondents answered that user fees (internal plus external) made up less than 50% of financial contributions for all of the surveyed SRRs.[1] Who, therefore, is slated to cover the revenue gap in SRRs' balance sheets? Their parent institution? A private philanthropic investor? From the administrators' desks, SRRs appear to be a money pit offering subsidized products. Let us take a moment to step back from this narrative and reframe the true value of SRRs by examining the language we chose to describe our enterprises.

It is often said that SRRs receive "subsidies" from home departments, colleges, or central university administration.[2] In a pure economic sense, subsidies are meant to affect demand and supply of goods and services in an open market. Given that no 2 core facilities are the same and that there are limited substitutes for the services the core facilities provide, demand is inelastic—reducing the cost does not affect demand.[3]

The services provided by SRRs are essential, and researchers cannot simply seek alternatives and still be successful in executing on project deliverables. Subsidies do not affect demand for services provided in the

SRRs. What then is the purpose of subsidies in an inelastic demand environment? Are subsidies in SRRs a misnomer? We strongly believe so. We cannot influence demand, so we therefore cannot call this phenomenon a subsidy. We posit that what we have been calling SRR subsidies should accurately be called *investments*. Whereas subsidies in a demand inelastic environment are detrimental to the financial health of the organization, investments in a demand-inelastic market actually have a positive externality.

A positive externality is something that enhances the community as a whole. It is a result from an economic transaction made to and by others that benefits others who are not directly connected to the transaction. Examples of positive externalities in SRRs are grants secured by PIs, publications, student education and training, institutional prestige, increased collaborations, innovations, and, ultimately, more discoveries. Demonstrating the impact rather than revenue is a better metric to capture the externality of SRRs.

What are the primary objectives of academic research institutions? We could argue they are academics and research. SRRs demonstrate positive impacts toward both endeavors.

Education is the best example of a positive externality resulting from investments in SRRs. By centralizing the instrumentation and expertise, undergraduates, graduate students, postdocs, and research technicians come to SRR staff members for consistent training with quality control checkpoints along the research project's lifetime.[4],[5],[6] SRRs are foundational to the investment of research infrastructure. This paves the way for SRRs to provide an equitable space where researchers in less federally funded fields can still accomplish great science. By sharing the cost burden across multiple groups, cores effectively de-risk the innovative process and push the boundaries of knowledge.[6]

CONCLUSION

Our position is that rather than acting as a subsidy, SRRs provide investments in faculty, investments in students, investments in innovation, and investments in the community. More important than any fiscal gain, the impact on education and innovation is the focus of our mission.

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